



Government of India
Ministry of Power
Central Electricity Authority
System Planning & Project Appraisal Division
SewaBhawan, R. K. Puram, New Delhi-110066
[ISO: 9001:2008]
Website: www.cea.nic.in



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Date: 28th Aug., 2015

To,

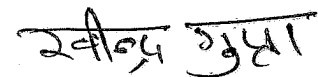
1	The Member (PS), Central Electricity Authority, SewaBhawan, R. K. Puram, New Delhi-110066	8	Engineer-in-Chief Power & Electricity Department, Govt. of Mizoram, Tuikhuahtlang, Aizawl (Mizoram) Fax: 0389-2320861/2320862
2	The Member Secretary, North Eastern Regional Power Committee(NERPC), NERPC Complex, Dong Parmaw Lapalang, Shillong – 793006 (Meghalaya) Fax: 0364 – 2534040/2520030	9	The Chief Engineer (Power), Electricity Department, Keisampat, Imphal (Manipur) - Fax: 0385 – 2220702/2220143
3	The Director (Projects), Power Grid Corp. of India Ltd., "Saudamini", Plot No. 2, Sector-29, Gurgaon-122001 Fax 0124-2571760/2571932	10	The Chairman-cum-Managing Director, Tripura State Electricity Corporation Limited, Bidyut Bhavan, Banamalipur, Agartala, Tripura. Fax: 0381 – 2319427
4	The Managing Director, Assam Electricity Grid Corporation Limited, BijuleeBhawan; Paltan Bazar, Guwahati (Assam) – 781001. Fax: 0361 – 2739513 & 0361 – 2739989	11	The Chairman and Managing Director, North Eastern Electric Power Corporation Ltd, Brookland Compound, Lower New Colony, Shillong (Meghalaya) – 793003. Fax: 0364 – 2226417
5	The Chairman-cum-Managing Director, Meghalaya Energy Corporation Limited, LumJingshai, Short Round Road, Shillong (Meghalaya) – 793001. Fax: 0364 – 2590355	12	Director (Projects), National Thermal Power Corp. Ltd.(NTPC), NTPC Bhawan, Core-7, Scope Complex, LodhiRoad, New Delhi-110003 Fax 011-24360912
6	The Chief Engineer (Power), VidyutBhawan, Department of Power, Zero Point Tinali, Itanagar (Arunachal Pradesh) – 791111. Fax: 0360 – 2217302	13	CEO, POSOCO, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi – 110016. Fax: 011 – 26852747 / 26524525/ 26536901
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Sub: Minutes of the 5th Standing Committee Meeting on Power System Planning of North Eastern Region.

Sir,

The 5th Standing Committee Meeting on Power System Planning of North Eastern Region was held on 08.08.2015 at Classic Hotel, Imphal, Manipur. The minutes of the meeting has been uploaded on CEA Website (www.cea.nic.in) at the following link –Home page-wing specific document-power systems-Standing Committee Meeting on Power System planning -North Eastern Region).

Yours faithfully,


(Ravinder Gupta) 28/8/15
Director

Minutes of the 5th Standing Committee Meeting on Power System planning of North Eastern Region

- 1.0 List of the participants is enclosed at Annexure-I.
- 2.0 Member (PS), CEA chaired the meeting. He welcomed the participants to the meeting. He said that agenda for the meeting is quite long and requested the participants for precise, to the point discussion to arrive at decision while deliberating various agenda items. He requested Chief Engineer, CEA to conduct further proceeding of the meeting.
- 3.0 Chief Engineer, CEA again welcomed the participants to the meeting. He informed that Ministry of Power has now delegated the power to grant prior approval of Government u/s 68 and authorisation u/s 164 of EA, 2003 to Chairperson, CEA. He said that Ministry of Power has also fixed the time lines for each activity from Concept to Commissioning of the transmission projects. In order to hold the Standing Committee meetings as specified in the time lines, he requested constituents to send the agenda items in advance which are to be included in the ensuing meeting. He added that Government of India has an ambitious plan of renewable energy (RE) addition of about 1,50,000 MW in next five years through solar parks and wind generation farms in RE resources rich states viz. Rajasthan, Gujarat, Tamil Nadu, Maharashtra, Karnataka, AP, HP and J&K and there is need for strengthening of transmission system for evacuation / integration of this renewable generation to other states. Thereafter, he requested Director, CEA to take up the agenda items.
- 4.0 **Confirmation of the minutes of 4th Standing Committee Meeting on Power System planning of North Eastern Region.**
 - 4.1 Director, CEA stated that the minutes of the 4th meeting of the Standing Committee on Power System Planning held on 13th Dec., 2014 at Guwahati, Assam were circulated vide CEA letter no. 81/4/2011-SP&PA/2445-57 dated 29th Dec., 2014. No comment from any constituent has been received. He requested constituents to confirm the minutes of the meeting.
 - 4.2 The minutes of the meeting were confirmed.
- 5.0 **North Eastern Region Strengthening Scheme (NERSS) – II : Part B**
 - 5.1 Director, CEA stated that in the previous standing committee meeting, it was decided that part-B of NERSS-II, having 5 elements would be implemented through tariff based competitive bidding (TBCB). RECTPCL is the bid process co-ordinator (BPC) for the scheme. The RfQ for the scheme was issued on 23-04-2015. In order to prepare RfP document, RECTPCL has written to various STUs of Arunachal Pradesh, Nagaland, Tripura and NEEPCO to provide necessary data relating to sub-station equipment etc. on 15-04-2015.
 - 5.2 He added that for the element Biswanath Chariali (NER PP) – Itanagar (Zebra conductor) 132 kV D/C, CTU was to provide 2 nos. line bays at Biswanath Chariali (NER PP) and Department of Power (DoP), Arunachal Pradesh was to provide space for construction of two no. 132 kV line bays at Itanagar S/s. In this regard, DoP, Arunachal Pradesh was to confirm
 - i) The availability of land for 2 no. 132 kV bays at Itanagar S/s.

- ii) To provide land free of cost to prospective transmission service provider (TSP)
 - iii) Technical data of 132 kV sub-station equipment at Itanagar S/s.
- 5.3 He said that the above information will form part of RfP document and the bidders would be quoting accordingly. Officials from CEA and RECTPCL had visited offices of DoP Arunachal Pradesh on 19.05.2015 and also held a meeting in CEA on 03-06-2015. The necessary information / confirmation is awaited from DoP, Arunachal Pradesh.
- 5.4 SE (Trans) DoP, Arunachal Pradesh agreed to provide land for 2 no. 132 kV bays at Itanagar free of cost and also necessary technical specifications relating to 132 kV equipment at Itanagar S/s.
- 5.5 Director, CEA stated that for Ranganadi – Nirjuli (Zebra conductor) 132 kV D/C line, CTU was to provide 2 nos. line bays at Nirjuli S/s and NEEPCO was to provide space for construction of two no. 132 kV GIS line bays at Ranganadi generation switchyard. Officials from CEA and RECTPCL had visited offices of NEEPCO on 21.05.2015. During site visit, it was observed that there is paucity of space at the Ranganadi switchyard and NEEPCO has already committed available space to DoP, Arunachal Pradesh for construction of line bays for their Itanagar-Ranganadi 132 kV D/C line. Team of CEA and RECTPCL also explored the possibility for accommodation of all four bays in limited available space along with officials of NEEPCO. It was found that 4 no. 132 kV line bays can be accommodated in the limited space, if the line bays are made GIS. For this, DoP, Arunachal Pradesh has to construct their line bays as GIS. In this regard, confirmation is awaited from DoP, Arunachal Pradesh.
- 5.6 SE (Trans) DoP, Arunachal Pradesh expressed their inability to construct 132 kV bays at Ranganadi as GIS, in view of fund constraint. He informed that their Ranganadi-Itanagar 132 kV D/C line is almost complete and they will complete the line bays at Ranganadi by 2015-16.
- 5.7 MD, AEGCL informed that Nirjuli 132 kV S/s of POWERGRID feeds not only loads of Arunachal Pradesh but also feeds the loads of Assam at Gohpur. Assam draws about 40-50 MW power from the Nirjuli and this line was planned to meet the loads of Assam in a reliable manner.
- 5.8 AGM, POWERGRID stated that in view of non-availability of space at Ranganadi and to augment power supply to Assam, linking of Biswanath Chariali with Gohpur or any other scheme can be studied and discussed in next SCM.
- 5.9 Director, CEA stated that in view of non-availability of space at Ranganadi, the Ranganadi – Nirjuli (Zebra conductor) 132 kV D/C line has to be dropped from the scope of NERSS-II. He added that other two elements of NERSS-II i.e. Imphal (PG) – New Kohima (State) 400 kV D/C line (to be initially operated at 132 kV) and Surajmaninagar-P. K. Bari 400 kV D/C (initially op. at 132 kV) would be discussed separately as agenda items. The remaining element of NERSS-II i.e. Silchar (PG) – Misa (PG) 400kV D/C (Quad) line remains unchanged.

- 5.10 Director, CEA stated that BPC has requested that the bays at STU substations to be developed under TBCB, should also be built by CTU as they have reciprocal arrangements with STUs. AGM, CTU stated that it is difficult to match the commissioning of bays with that of line and also CERC does not approve tariff for the period when the bays are commissioned ahead of the associated line though completed as per schedule. Further, there is difficulty in tendering for small works also.
- 5.11 AGM NLDC enquired whether CEA had evolved any norms regarding the responsibility of bays of transmission lines coming under TBCB viz. CTU or STU or the successful bidder under TBCB as different philosophy appeared to be operating at different places. Director, CEA stated that no norms had been evolved as of now and different approaches had various pros and cons with no clear option emerging.
- 5.12 After further discussions, it was decided that
- i) DoP, Arunachal Pradesh would provide land for 2 no, 132 kV line bays at Itanagar S/s free of cost.
 - ii) Ranganadi-Nirjuli 132 kV D/C line would be excluded from the scope of NERSS-II (Part-B).
 - iii) The scope of works to be covered under NERSS-II (Part-B) to be implemented through TBCB would be modified as below and is estimated to cost Rs. 1405.87 crores.
 - a. Biswanath Chariali - Itanagar (Zebra conductor) 132 kV D/c line
 - b. Silchar - Misa 400kV D/c line (Quad) line
 - c. 2 no. 132 kV line bays at Itanagar for termination of Biswanath Chariali - Itanagar (Zebra conductor) 132 kV D/c line
- Note:**
- a) *DoP, Arunachal Pradesh would provide space for 2 no. 132kV line bays at Itanagar S/s for termination of Biswanath Chariali (POWERGRID) – Itanagar 132kV D/c (Zebra conductor) line*
 - b) *CTU (POWERGRID) would provide 2 no. 400kV GIS line bays each at Silchar and Misa for termination of Silchar - Misa 400kV D/c line (Quad) line*
 - c) *CTU (POWERGRID) would provide 2 no. 132kV line bays at Biswanath Chariali for termination of Biswanath Chariali - Itanagar (Zebra conductor) 132 kV D/c line. In case there is a space constraint, GIS bays would be provided.*
 - d) *80 MVAR bus reactor at Misa (PG) along with GIS bay*
 - e) *1x80 MVAR switchable line reactor with GIS bays at Misa end of each circuit of Silchar– Misa 400kV D/C line*
- 5.13 It was also agreed that for any scheme involving substation extension, if there is a space constraint, GIS bays may be considered in place of AIS bays as a

general principle. However, if a new substation needs to be constructed as GIS one, the same may be discussed.

- 5.14 Imphal (PG) - New Kohima (State) 400 kV D/c line (to be initially operated at 132 kV) and Surajmaninagar - P. K. Bari 400 kV D/c (initially op. at 132 kV) earlier included in NERSS-II Part-B are now proposed to be charged directly at 400 kV. Accordingly, these lines along with associated sub-station works have been taken out from this scheme to facilitate timely execution of balance portion of NERSS-II Part-B. These 2 nos. 400 kV lines are proposed to be taken up as a separate project as mentioned below at item 6.0.

6.0 400 kV operation of Palatana-Surajmaninagar-P. K. Bari-Silchar 400 kV D/C line

- 6.1 Director, CEA stated that in the previous Standing Committee meeting, in order to improve reliability of evacuation system from Palatana generation project, 400 kV operation of alternate corridor i.e. Palatana-Surajmaninagar-P. K. Bari-Silchar and construction of intermediate link i.e. Surajmaninagar-P. K. Bari 400 kV D/C (initially op. at 132 kV) was agreed. As the new lines and sub-stations are to be built through TBCB, there may be two different TSPs one building transmission line (initially op. at 132 kV) and other building portion of the lines for linking with 400 kV sub-stations. This may lead to a situation, where different sections of a line may belong to different TSPs. In order to avoid complications, which may arise in future, it is proposed to build and operate the entire corridor at 400 kV in a single stage.
- 6.2 AGM, POWERGRID stated that the 400kV Palatana-Surajmaninagar-P. K. Bari-Silchar corridor may not be justified from load flow studies. However, if constituent states desire, the same may be considered as an alternate corridor to Palatana-Silchar 400kV D/c line on the basis of reliability and tower outage considerations.
- 6.3 Director, CEA added that 400 kV operation of Palatana-Surajmaninagar 400 kV D/c line at Palatana end would require 2 no. 400 kV bays at Palatana GBPP and termination at 400 kV from existing 132 kV to be built by OTPC. Palatana-Surajmaninagar 400 kV D/c line is existing and owned by POWERGRID. The BPC has informed that this line has about 8 no. 220 kV towers.
- 6.4 POWERGRID informed that 4 no. of towers at Palatana end and 4 no. towers at Surajmaninagar end are built at 220 kV for termination at 132 kV Palatana switchyard and Surajmaninagar S/s. For termination at 400 kV level at these sub-stations, the line has to be reoriented / reconfigured and some additional towers at 400 kV are required to be built at both ends. He added that at present, line bays at other than POWERGRID sub-stations are to be built through TBCB. Therefore, the 400 kV bays at Palatana should be under the scope of TBCB.
- 6.5 Director, CEA said that in order to avoid Palatana-Surajmaninagar 400 kV D/c line being owned by TSP and POWERGRID, it is proposed that additional 400 kV towers required for termination at both ends, be built by POWERGRID.

Further, the 400 kV bays at Palatana would be built through TBCB. Members agreed for the same.

- 6.6 He added that the 400 kV operation of Palatana-Surajmaninagar 400 kV D/c line (being operated at 132 kV) at Surajmaninagar end would require establishment of 2x315 MVA 400/132 kV S/s at Surajmaninagar. (Under TBCB).
- 6.7 Additional GM, TSECL informed that adequate land is available for establishment of 400/132 kV S/s at Surajmaninagar adjacent to existing 132 kV S/s and TSECL would provide the land to the prospective TSP for the S/s at reasonable cost. However, there may be a gap of about 500 meters between 132 kV & 400 kV switchyards. He also informed that 2nd 1x125 MVA 400/132 kV ICT at Palatana is under implementation by OTPC. He added that at present only 2 no. 132 kV line bays are available at Palatana generating switchyard. One bay is being utilised for one circuit of Palatana – Surajmaninagar 132 kV D/C line and other bay constructed for termination of other circuit of Palatana – Surajmaninagar 132 kV D/C line has been used for termination of Palatana-Udaipur 132 kV S/C line.
- 6.8 Director, CEA stated that about 100MW power is planned to be exported to Bangladesh from Tripura by December, 2015 and for reliable transfer of power to Bangladesh both the circuits from Palatana to Surajmaninagar are required. He requested TSECL to disconnect their 132 kV line to Udaipur from Palatana so that the other circuit of Palatana-Surajmaninagar can be connected.
- 6.9 Addl. GM, TSECL informed that Tripura is drawing about 40-50 MW power over this line and its disconnection would create a difficult situation for Tripura.
- 6.10 Director, CEA said that for reliable transfer of power to Bangladesh, both circuits of Palatana-Surajmaninagar line are required. He requested OTPC to construct one no. additional 132 kV line bay at Palatana and CEA would write a letter to OTPC in this regard.
- 6.11 He added that P. K. Bari-Silchar 400 kV D/C line (initially operated at 132 kV) is under construction by POWERGRID and 400 kV operation of this section would require 2 no. 400 kV bays at Silchar (by POWERGRID), establishment of 2x315 MVA 400/132 kV sub-station at P. K. Bari (under TBCB) and termination of P. K. Bari-Silchar line at 400 kV P. K. Bari S/s & Silchar S/s. In the previous meeting, it was decided that Surajmaninagar-P. K. Bari 400 kV D/C line (initially operated at 132 kV) would be implemented under TBCB. Now it is proposed that this line would be directly operated at 400 kV instead of initial operation at 132 kV as agreed earlier.
- 6.12 AGM NLDC stated that even with the second 400/132 kV, 125 MVA ICT at Palatana and the second 132 kV Palatana-Surajmaninagar line in operation, the system would be N-1 insecure under a single ICT or line outage. The loading on the existing 400/132 kV, 125 MVA ICT at Palatana is already high and touched 120-125 MVA recently. The loading may further go up with proposed 100 MW power transfer to Bangladesh. This may continue till the Surajmaninagar and P K Bari substations start operating at 400 kV. This may also have an impact on Palatana auxiliary supply at 132 kV.

- 6.13 Director, CEA stated that OTPC is adding one more 400/132 kV, 125 MVA transformer at Palatana generating switchyard. The load flow studies carried out by NERLDC for 100 MW transfer to Bangladesh indicate that major power to Bangladesh is supplied by Monachack gas based project and remaining is supplied by other interconnection at Surajmaninagar.
- 6.14 After further discussion, 400 kV operation of the alternate corridor was agreed with following scope of works:
- i) 2 no. 400 kV line bays at Palatana GBPP switchyard for termination of Palatana – Surajmaninagar 400kV D/c line (under TBCB)
 - ii) 1 no. 132 kV bay at Palatana GBPP (by OTPC)
 - iii) Additional 400 kV D/C line at Palatana end for termination of Palatana-Surajmaninagar 400 kV D/C line (op. at 132 kV) at 400 kV Palatana switchyard (By POWERGRID)
 - iv) Establishment of 2x315 MVA 400/132 kV S/s at Surajmaninagar with 4 no. 400 kV line bays, 2x125 MVAR bus reactor and 4 no. 132 kV line bays (under TBCB)
 - v) Additional 400 kV D/C line at Surajmaninagar end for termination of Palatana-Surajmaninagar 400 kV D/C line (op. at 132 kV) line at 400 kV Surajmaninagar S/s (By POWERGRID)
 - vi) Surajmaninagar (TSECL) – Surajmaninagar (TBCB) 132 kV D/C line with high capacity / HTLS (equivalent of single moose) (By TSECL)
 - vii) Establishment of 2x315 MVA 400/132 kV S/s at P. K. Bari with 4 no. 400 kV line bays, 2x125 MVAR bus reactor and 4 no. 132 kV line bays (under TBCB)
 - viii) Surajmaninagar (TBCB)-P. K. Bari 400 kV D/C line (under TBCB)
 - ix) P. K. Bari (TSECL) – P. K. Bari (TBCB) 132kV D/c line with high capacity / HTLS (equivalent of single moose) (By TSECL)
 - x) Additional 400 kV D/C line at P. K. Bari end for termination of P. K. Bari-Silchar 400 kV D/C line (initially op. at 132 kV) at 400 kV P. K. Bari S/s (By POWERGRID)
 - xi) Additional 400 kV D/C line at Silchar end for termination of P. K. Bari-Silchar 400 kV D/C line (initially op. at 132 kV) at 400 kV Silchar S/s (By POWERGRID)
 - xii) 2 no. 400 kV GIS line bays at Silchar for termination of P. K. Bari – Silchar 400kV D/c line (By POWERGRID)

Note: TSECL may plan and inform the utilisation of remaining 2 no. 132 kV bays at each Surajmaninagar & P.K. Bari 400/132kV substation.

- 6.15 Thus, the above agreed scheme is proposed to be implemented as North-Eastern Region Strengthening Scheme-V (NERSS-V) with following scope of works:

A. NERSS-V – TBCB Scope: (Estimated cost Rs. 619.24 cr.)

- (i) Establishment of 2x315 MVA 400/132 kV S/s at Surajmaninagar with 4 no. 400 kV line bays, 2x125 MVAR bus reactor and 4 no. 132 kV line bays

(Land for the Surajmaninagar 400/132kV S/s is identified and available with Tripura and the same would be provided to the TSP at cost.

- (ii) Establishment of 2x315 MVA 400/132 kV S/s at P. K. Bari with 4 no. 400kV line bays, 2x125 MVAR bus reactor and 4 no. 132 kV line bays
- (iii) Surajmaninagar - P. K. Bari 400 kV D/c line
- (iv) 2 no. 400 kV line bays at Palatana GBPP switchyard for termination of Palatana – Surajmaninagar 400kV D/c line

B. NERSS-V (Part-B) – POWERGRID Scope:

- (i) Additional 400 kV D/c line at Palatana end for termination of Palatana-Surajmaninagar 400 kV D/c line (op. at 132 kV) at 400 kV Palatana switchyard
- (ii) Additional 400 kV D/c line at Surajmaninagar end for termination of Palatana-Surajmaninagar 400 kV D/c line (op. at 132 kV) at 400 kV Surajmaninagar S/s
- (iii) Additional 400 kV D/c line at P. K. Bari end for termination of P. K. Bari-Silchar 400 kV D/c line (initially op. at 132 kV) at 400 kV P. K. Bari S/s
- (iv) Additional 400 kV D/c line at Silchar end for termination of P. K. Bari-Silchar 400 kV D/c line (initially op. at 132 kV) at 400 kV Silchar S/s
- (v) 2 no. 400 kV GIS line bays at Silchar for termination of P. K. Bari – Silchar 400kV D/c line

Further, TSECL and OTPC would implement the following scope of works:

- i) 1 no. 132 kV bay at Palatana GBPP (by OTPC)
- ii) Surajmaninagar (TSECL) – Surajmaninagar (TBCB) 132 kV D/C line with high capacity / HTLS (equivalent of single moose) (By TSECL)
- iii) P. K. Bari (TSECL) – P. K. Bari (TBCB) 132kV D/c line with high capacity / HTLS (equivalent of single moose) (By TSECL)

TSECL may plan and inform the utilisation of remaining 2 no. 132 kV bays each at Surajmaninagar and P. K. Bari 400/132kV substation.

7.0 Construction of Imphal-New Kohima 400 kV D/C line

- 7.1 Director, CEA stated that in the previous standing committee meeting, construction of Imphal-New Kohima 400 kV D/C line (initially operated at 132 kV) and construction of New Kohima-Misa 400 kV D/C line to be taken up along with 400 kV operation of Imphal-New Kohima 400 kV D/C line was agreed. The Imphal-New Kohima 400 kV D/C line is to be implemented through TBCB. The 400 kV operation of the above line in future would require establishment of 400/132 kV sub-stations at New Kohima and reconfiguration of the line from 132 kV S/s to 400 kV sub-station at Imphal and New Kohima. As the line and New Kohima S/s is proposed to be implemented through TBCB, in order to avoid any complication in future as discussed earlier, it is proposed that the entire line from Imphal to New Kohima should be constructed and operated at 400 kV in single stage. The extension of New

Kohima to Misa via New Mariani of POWERGRID would be discussed at agenda item 10.

- 7.2 AGM, POWERGRID stated that the 400kV Imphal – New Kohima corridor may not be justified from load flow studies however the same may be considered as an alternate corridor to Silchar - Misa 400kV D/c line on the basis of reliability and tower outage consideration, if the members agree for the same. He further stated that 400 kV operation of this line would cause over voltage in the system and suggested for one more 1x125 MVAR bus reactor at Imphal.
- 7.3 After further discussion, following scope of works were agreed to be implemented:
- i) Imphal-New Kohima 400 kV D/C line (under TBCB)
 - ii) 2 no. 400 kV line bays and 1x125 MVAR bus reactor (2nd) at Imphal (PG) (by POWERGRID)
 - iii) Establishment of 2x500 MVA 400/220 kV S/s at New Kohima along with 4 no. 400 kV line bays, 2x125 MVAR bus reactor and 4 no. 220 kV line bays (under TBCB).
 - iv) New Kohima (400/220 kV TBCB) – New Kohima (220/132kV - Nagaland) 220 kV D/c line with high capacity / HTLS conductor equivalent to twin moose (by Nagaland)

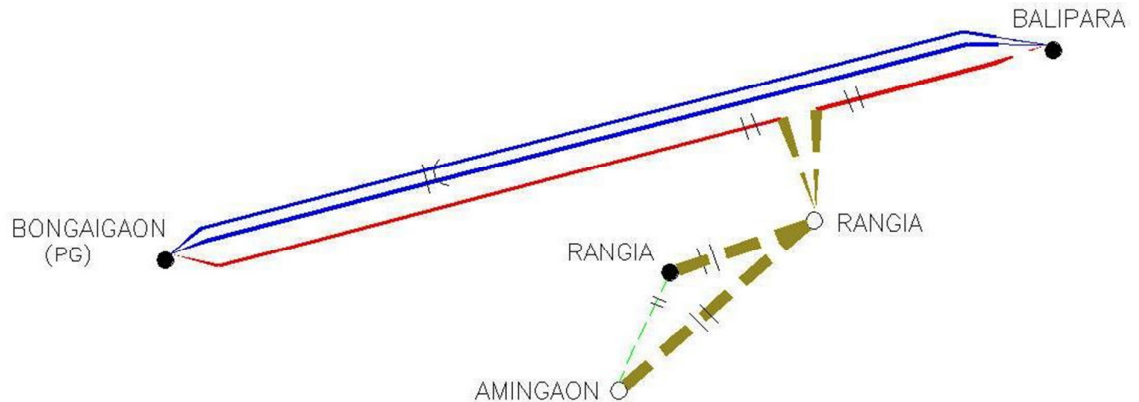
Note: Nagaland may plan and inform the utilisation of remaining 2 no. 220kV bays at New Kohima 400/220kV substation.

8.0 Establishment of 400/220 kV S/s at Rangia LILO of one circuit of 400 kV Balipara-Bongaigaon- Agenda by AEGCL

- 8.1 Director, CEA stated that in the 4th SCM of NER, it was agreed that AEGCL would be provided with 2 no. 400 kV bays at Rangia / Rowta 400 kV pooling station and the pooling station is getting delayed because of delay in hydro generating projects in Twang & Kameng basins in Arunachal Pradesh.
- 8.2 He added that AEGCL has informed that the because of industrialisation, the demand in Kamrup district and North bank district of Assam is increasing rapidly. AEGCL has proposed establishment of 2x160 MVA 220/132 kV GIS S/s at Amingaon and Rangia-Amingaon 220 kV D/C line as a part of scope of works for the NERPSIP under tranche-I. There is only one 220 kV interconnection between Bongaigaon (NTPC) and Rangia. In order to improve the reliability of power supply to Western part of Assam, AEGCL has proposed establishment of a new 2x500 MVA 400 kV S/s at Rangia by LILO of one circuit of Balipara-Bongaigaon 400 kV D/C (Quad) line. The proposed 400/220 kV Rangia S/s will feed the existing Rangia and proposed Amingaon 220/132 kV sub-stations. The estimated cost of the scheme is about Rs. 337.21cr.
- 8.3 AGM, POWERGRID stated that at present there are two 400 D/C lines between Balipara and Bongaigaon. The line-1 i.e. circuits 1&2 is with twin moose conductor and the line-2 i.e. circuit 3&4 is with Quad moose conductor. Series compensation is also provided on the line-2. The LILO of one circuit on

the line-2 at Rangia would over compensate the Balipara- Rangia section of the line after LILO. He suggested that the line-1 should be LILO at Rangia and in order to avoid unbalanced loading, both the circuits of the line-1 should be LILO at Rangia.

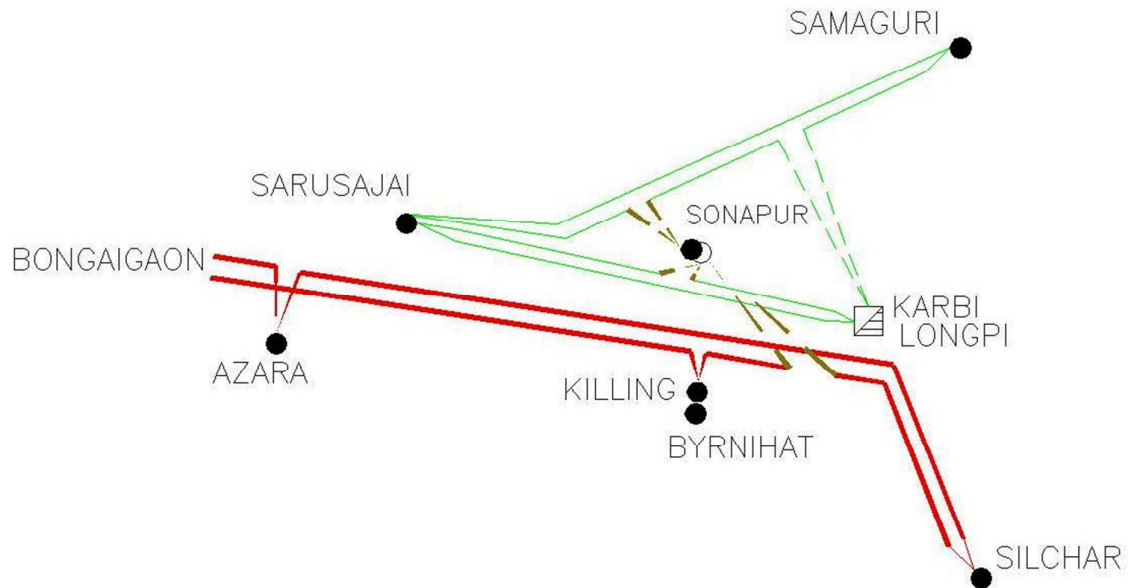
- 8.4 After further discussion, the proposal for establishment of 2x500 MVA 400/220 kV S/s at Rangia by LILO of both circuits of Balipara-Bongaigaon 400 kV D/C line-1 with twin moose conductor along with 2x80 MVAR bus reactors was agreed to be implemented by AEGCL. The proposed 400 kV S/s at Rangia would feed both existing Rangia 220 kV S/s and proposed Amingaon 220 kV S/s. The schematic diagram is given below:



9.0 Establishment of 400/220 kV S/s at Sonapur in Eastern part of Guwahati - Agenda by AEGCL

- 9.1 Director, CEA stated that presently, Guwahati city is fed from 2x315 MVA 400/220 kV S/s at Azara situated in Western part of the city. In order to mitigate the contingency of Azara 400 kV S/s, AEGCL has proposed establishment of a 2x315 MVA 400/220 kV S/s in the Eastern part of the Guwahati by LILO of Silchar-Byrnihat 400 kV line. The LILO portion would be about 20 km. Sonapur 220/132 kV 2x100 MVA S/s is under construction through LILO of one circuit of Samaguri – Sarusajai 220kV D/C line and also through LILO of one circuit of Karbi Langpi HEP (KLHEP) – Sarusajai 220kV D/C line. The estimated cost of the scheme is about 289.18 cr. At present one circuit of Silchar-Bongaigaon 400 kV D/C line is LILO at Byrnihat and the other circuit is LILO at Azara, thus forming Silchar-Byrnihat-Bongaigaon and Silchar-Azara-Bongaigaon 400 kV S/C lines.
- 9.2 He requested AEGCL to confirm the location of proposed Sonapur S/s, whether it would be near to Silchar-Byrnihat section or Silchar-Azara section of Silchar-Bongaigaon 400 kV D/C line. He also invited comments from MePTCL about the proposal of AEGCL.
- 9.3 AGM, AEGCL confirmed that the Sonapur S/s would be near to the Silchar-Byrnihat line and is contiguous to under construction 220/132 kV Sonapur S/s.
- 9.4 ACE, MePTCL informed that they are also planning a 400/220 kV S/s at New Shillong by LILO of Silchar-Azara section of the Silchar-Bongaigaon 400 kV D/C line. He agreed to the proposal of AEGCL.

- 9.5 After discussion, the proposal of AEGCL for establishment of 2x315 MVA S/s at Sonapur by LILO of Silchar-Byrnihat 400 kV line along with 2x80 MVAR bus reactors and 220 kV inter-connections as indicated above. The schematic is given below.



10.0 Establishment of 400/220 kV S/s at New Mariani in lieu of establishment of 400/220 kV S/s at Khumtai (Golaghat district) by constructing 400 kV D/C line from Biswanath Chariali - Agenda by AEGCL

10.1 Director, CEA stated that presently there is no 400 kV sub-station in the upper Assam. For evacuation of power from Kathalguri gas based generating station of NEEPCO, Kathalguri-Misa 400 kV D/C line (charged at 220 kV) was constructed and one circuit of this line is LILO at Mariani S/s of AEGCL and the other circuit is LILO at New Mariani S/s of POWERGRID. In the event of low generation at Kathalguri or outage of LILO line upper Assam has to face severe load shedding. AEGCL has proposed establishment of a 2x315 MVA 400/220 S/s at Khumtai (Golaghat) along with a 400 kV D/C line from Biswanath Chariali to Khumtai with Brahmaputra river crossing. The existing two numbers Samaguri-Mariani 220 kV S/C line would be LILO at Khumtai S/s. The estimated cost of the scheme is about 473.14 crs. This does not include the cost of proposed 40 km 132kV D/C line from Khumtai to Golaghat and LILO of Jorhat (West) – Bokakhat 132kV S/C line -5.0 km.

10.2 He added that in the 4th SCM, the construction of 400 kV D/C line from Misa to New Kohima was agreed in principle and this link would be taken up for construction along with construction of 400 kV sub-station at New Kohima and 400 kV operation of Imphal-New Kohima 400 kV D/C line. Further, Kathalguri-Misa is a 400 kV D/C line which is being operated at 220 kV. With no additional generation anticipated at Kathalguri 400 kV operation of this line is not envisaged in future. However, if New Mariani S/s of POWERGRID is upgraded to 400 kV, then a section of Kathalguri-Misa line from New Mariani to Misa can be operated at 400 kV and New Mariani can be connected to New Kohima 400 kV S/s in Nagaland.

- 10.3 AGM, POWERGRID said that with the proposal for up-gradation of New Mariani S/s to 400 kV level the part of Kathalguri-Misa line from New Mariani to Misa would be operated at 400 kV and from New Mariani to Kathalguri would be operated at 220 kV.
- 10.4 After further discussions, the proposal of up-gradation of New Mariani S/s of POWERGRID from 220 kV to 400 kV was agreed in place of 400/220 kV Khumtai S/s of AEGCL with following scope of works.
- i) Up-gradation of New Mariani substation to 400/220 kV with 2x500MVA transformer along with 4 no. 400 kV bays (By POWERGRID)
 - ii) 2 no. 400 kV line bays at Misa (GIS) (By POWERGRID)
 - iii) Termination of Misa-New Mariani section of existing LILO of Kathalguri-Misa 400 kV D/C line (circuit-1) (op. at 220 kV) at New Mariani from 220 kV to 400 kV switchyard. (By POWERGRID)
 - iv) Disconnection of Kathalguri - Mariani (AEGCL) - Misa line from Mariani (AEGCL) S/s and LILO of the same at New Mariani (POWERGRID) with Misa-New Mariani section connected at 400kV and Kathalguri – New Mariani section connected at 220kV at New Mariani (By POWERGRID)
 - v) New Kohima – New Mariani 400kV D/c line (TBCB)
 - vi) Operation of New Mariani – Misa 400kV D/c line (presently charged at 220kV) at 400kV and along with termination at Misa at 400kV S/s. (By POWERGRID)
 - vii) Operation of New Mariani – Kathalguri 400kV D/c line (presently charged at 220kV) at 220kV (By POWERGRID).
 - viii) New Mariani – Mariani 220kV D/c line (with high capacity Conductor) (By AEGCL)
 - ix) Termination of Samaguri – Mariani 220kV 2xS/c lines at New Mariani (By AEGCL)
 - x) Establishment of 220/132kV, 2x160MVA substation at Khumtai (By AEGCL)
 - xi) LILO of Samaguri – New Mariani 220kV 2xS/c lines at Khumtai (By AEGCL)
- 10.5 Thus, combining the scope of works agreed at agenda items 7 and 10, the scheme is proposed to be implemented as North-Eastern Region Strengthening Scheme-VI (NERSS-VI):

A. NERSS-VI – TBCB Scope (Estimated cost Rs. 1338.47 crores)

- (i) Establishment of 2x500 MVA 400/220 kV S/S at New Kohima along with 4 no. 400 kV line bays, 2x125 MVA bus reactor and 4 no. 220 kV line bays
- (ii) Imphal – New Kohima 400 kV D/C line
- (iii) New Kohima – New Mariani 400kV D/c line

Note:

- a. CTU (POWERGRID) to provide 2 no. 400 kV line bays at Imphal (PG) S/s for termination of Imphal – New Kohima 400kV D/c line
- b. CTU (POWERGRID) to provide 2 no. 400kV line bays at New Mariani S/s for termination of New Kohima – New Mariani 400kV D/c line

B. NERSS-VI – POWERGRID Scope

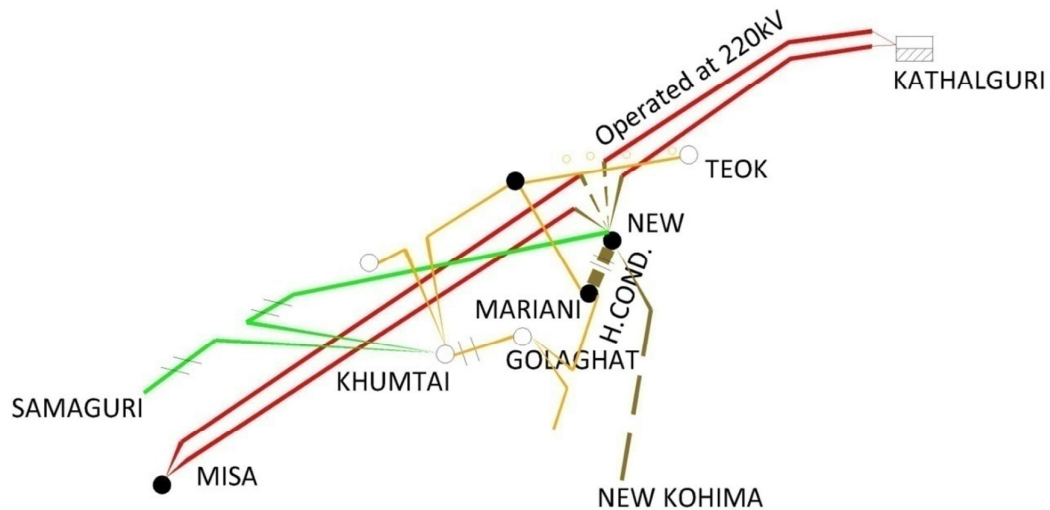
- (i) 1x125 MVAR bus reactor (2nd) at Imphal (PG)
- (ii) Up-gradation of New Mariani substation to 400/220 kV with 2x500MVA transformer along with associated bays.
- (iii) 2 no. 400kV line bays at New Mariani for termination of Misa-New Mariani 400kV D/c at 400kV
- (iv) Termination of Misa-New Mariani section of existing LILO of Kathalguri-Misa 400 kV D/C line (circuit-1) (op. at 220 kV) at New Mariani from 220 kV to 400 kV
- (v) Disconnection of Kathalguri - Mariani (AEGCL) - Misa line from Mariani (AEGCL) S/s and LILO of the same at New Mariani (POWERGRID) with Misa-New Mariani section connected at 400kV and Kathalguri – New Mariani section connected at 220kV at New Mariani
- (vi) 2 no. 400 kV line bays (GIS) at Misa for termination of New Mariani – Misa 400kV D/c line (presently charged at 220kV) at 400kV
- (vii) Operation of New Mariani – Misa 400kV D/c line (presently charged at 220kV) at 400kV along with termination at Misa at 400kV
- (viii) Operation of New Mariani – Kathalguri 400kV D/c line (presently charged at 220kV) at 220kV

Further, Nagaland and AEGCL would implement the following scope of works

- i) New Mariani – Mariani 220kV D/c line (with high capacity Conductor) (By AEGCL)
- ii) Termination of Samaguri – Mariani 220kV 2xS/c lines at New Mariani (By AEGCL)
- iii) Establishment of 220/132kV, 2x160MVA substation at Khumtai (By AEGCL)
- iv) LILO of Samaguri – New Mariani 220kV 2xS/c lines at Khumtai (By AEGCL)
- v) New Kohima (400/220kV TBCB) – New Kohima (220/132kV - Nagaland) 220kV D/c line with high capacity / HTLS conductor equivalent to twin moose (by Nagaland)

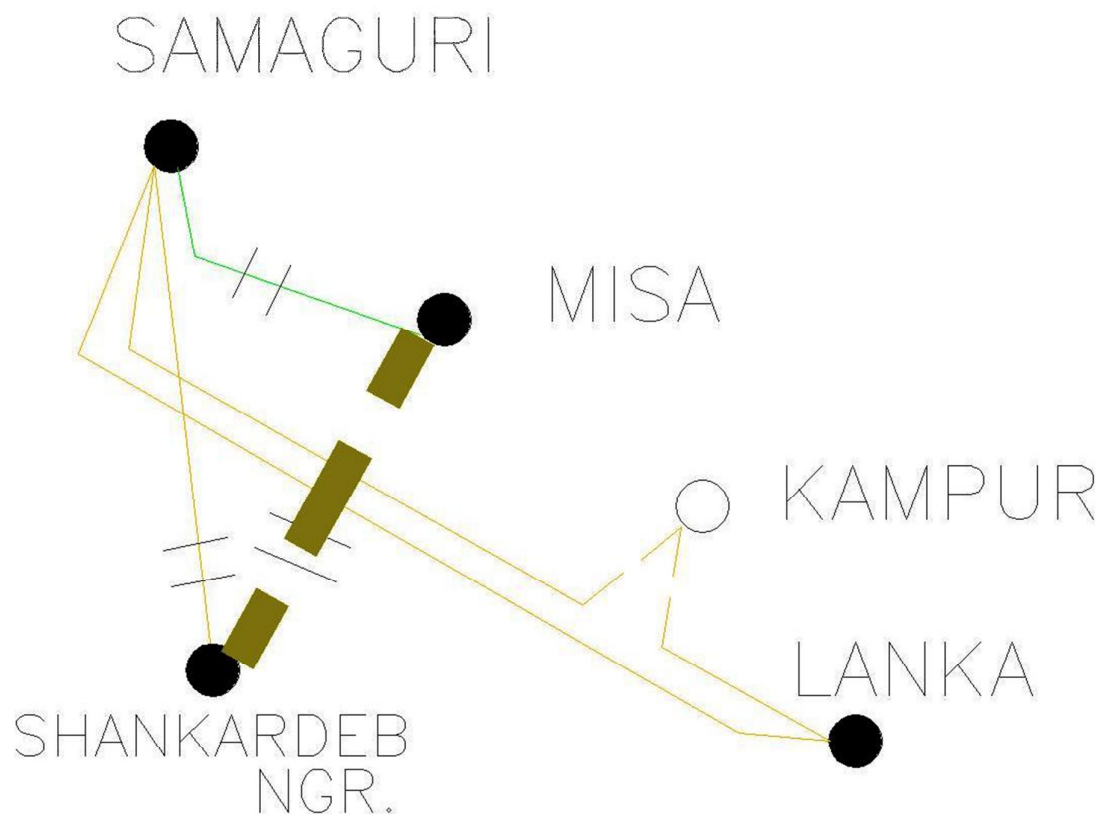
Note: Nagaland may plan and inform the utilisation of remaining 2 no. 220kV bays at New Kohima 400/220kV substation.

10.6 A schematic diagram is given below.



11.0 Extension of 2 nos. of 220kV Bays at Misa 400/220kV Substation for Misa–Shankardeb Nagar 220 kV D/C line – Agenda by AEGCL

- 11.1 Director, CEA stated that AEGCL has proposed to upgrade existing 132/33kV Shankardeb Nagar to 220/132/33kV S/s as part of power evacuation of Lower Kopili HEP (LKHEP) to be constructed by Assam Power Generation Company Ltd. Presently Shankardeb Nagar S/s is connected by 132kV D/C line from Samaguri 220/132/33kV Substation and is feeding industrial load radially. This causes overloading on Misa – Samaguri 220 kV D/C line. This problem can be overcome by constructing Misa-Shankardeb Nagar 220 kV D/C line about 15 km. The new 220 kV S/s at Shankardeb Nagar will also help in meeting future growth of Karbianglong and part of Nagaon Districts of Central Assam. This would require 2 no. 220 kV bays at Misa.
- 11.2 He added that 2 no. 220 kV bays released at Misa because of 400 kV operation of New Mariani-Misa section of Kathalguri-Misa 400 kV D/C line (op. at 220 kV) could be utilised for Shankardeb Nagar S/s. The estimated cost of the proposed Misa- Shankardeb Nagar D/C line will be Rs. 18.90 crs and cost of up-gradation of Shankardeb Nagar 220kV S/s will be Rs. 78.0 crs.
- 11.3 Members agreed to the proposal of AEGCL for 2 no. 220 kV bays at Misa for their Misa-Shankardeb Nagar 220 kV D/C line. The schematic diagram is given below:



12.0 Proposal for introduction of 220kV system at Biswanath Chariali (PGCIL) by installing one number 315 MVA, 400/220kV Transformer and 4 nos. 220kV Bays for D/C LILO of ongoing Sonabil – Dhemaji/Silapathar 220kV D/C line – Proposal of AEGCL

- 12.1 Director, CEA stated that presently all the North Bank Districts of Assam is facing acute shortage of power. AEGCL has already proposed one 220kV D/C line from Sonabil to Dhemaji/Silapathar, where one section of the proposed line up to Biswanath Chariali, is already in the process of finalisation of bidding. The establishment of 220/132kV substation at Dhemaji along with Behiating (New Dibrugarh)-Dhemaji 220 kV D/C line with Brahmaputra River crossing has been covered under NERPSIP tranche-I. Further, AEGCL has planned establishment of Narayanpur220/33kV substation with LILO of one circuit of Sonabil – Dhemaji/Silapathar 220kV D/C in 13th Plan.
- 12.2 He added that AEGCL has proposed introduction of 220kV level at Biswanath Chariali so as to form a 220kV ring network in Brahmaputra valley and to improve the reliability of intra-state network for growing demand of Assam. The approximate cost of introduction of 220kV system at Biswanath Chariali, considering Gas Insulated Type substation will be around Rs. 105 crores.
- 12.3 AGM, POWERGRID stated that at the request of constituents 132 kV level was created at Biswanath Chariali. The Biswanath Chariali HVDC station is expected to be commissioned shortly. Four no. of 132 kV bays at Biswanath Chariali S/s have been planned for Biswanath Chariali – Biswanath Chariali and Biswanath Chariali – Itanagar 132 kV D/c lines. However if required, 2 more 132kV bays at GIS for new 132kV line feed to Assam may be provided at Biswanath Chariali. In view of above, it is not advisable to create multi

voltage level at Biswanath Chariali, which is going to become an important station of NER. He added that to meet the growing demand of Assam, a joint study may be carried out to identify the intra-state strengthening requirement in Assam.

- 12.4 After further discussion, it was decided that AEGCL should carry out system studies to identify the intra-state transmission system requirement and share it with CEA and CTU. The need for creation of 220 kV level at Biswanath Chariali would depend on the outcome of the study and would be discussed in subsequent Standing Committee meeting.

13.0 Construction of two no. of 132 kV line Bays at 132 kV switchyard, Leimatak of NHPC – Agenda by MSPCL

- 13.1 MD, MSPCL stated that Manipur is drawing its allocated share from Central Sector Generating Stations in NER mostly through (i) Imphal (PG) – Imphal (State) and (ii) Leimatak – Ningthoukhong 132 kV lines. Load Flow Study conducted by PGCIL on the request of Manipur Government with a projected peak demand of 425 MW and additional interstate connectivity of i) Silchar – Imphal (PG) 400 kV D/C line & ii) Imphal (PG) – New Kohima 400 kV D/C line both charged at 132 kV system voltage, shows 97 MW flowing through Leimatak – Ningthoukhong 132 kV S/C line. Also, whenever Manipur draws about 130 MW or above, the flow in this line exceeds its SIL and most of the time SLDC, Manipur has tough time to bring down the power flow in this line to acceptable limit.

- 13.2 He added that to mitigate the constraint in drawing Manipur's share, Manipur State Power Company Limited has taken up the construction of a new Leimatak – Ningthoukhong 132 kV D/C line (2nd line) for which construction of two 132 kV line bays at 132 kV switchyard, Leimatak under NHPC is required.

- 13.3 Manager, NHPC informed that at present 9 no. 132 kV bays are existing at their Leimatak generating switchyard, which includes 4 no. feeder bays, 3 no. unit bays, one bus coupler bays and one auxiliary bay . There is space constraint at the generating switchyard.

- 13.4 After further discussion, it was decided that a joint survey by NHPC and MSPCL would be carried out to explore the possibility of space at the generating switchyard for accommodating two no. 132 kV bays for Leimatak – Ningthoukhong 132 kV D/C line. If space is available after the joint survey, NHPC would provide space for 2 no. 132 kV bays and the bays would be under the scope of MSPCL.

14.0 Construction of two nos. of 400 kV line bay at Imphal (PG) – agenda by MSPCL

- 14.1 MD, MSPCL stated that to meet the growing load demand of Manipur, MSPCL has taken up the construction of 4x105 MVA, 400/132 kV single phase transformer (one spare) at Thoubal along with the Imphal (PG)-Thoubal 400 kV D/C - 38 km line In the previous Standing Committee Meeting, 400 kV operation of Silchar-Imphal (PG) 400 kV D/C line along with up-gradation of 2x50 MVA 132/33 kV Imphal (PG) S/s to 400 kV by addition of 7x105 MVA 400/132 kV single phase transformers (one spare) was agreed. Construction

of Imphal (PG)-Thoubal 400 kV D/C line would require 2 no. 400 kV line bays at Imphal (PG) 400 kV S/s.

14.2 Members agreed for providing space for 2 no. 400 kV bays at Imphal (PG) and the 400 kV bays would be built by MSPCL.

15.0 Providing of additional inter-state 132 kV link between Imphal(PG) and Imphal (State)

15.1 MD, MSPCL stated that 132 kV Sub-Station at Yurembam (Imphal-State) and Ningthoukhong are among the prominent pooling points of the state. 132 kV Sub-station at Yurembam (Imphal-State) is being upgraded from 3x20 MVA to 3x31.5 MVA along with the modernization of all the associated equipment under the Renovation and Modernization programme of 132 kV Sub-Stations in Manipur. It is also connected to 132 kV Sub-stations at Karong (2x20 MVA), Yaingangpokpi (2x20 MVA) and Kongba (2x20MVA). 132 kV Sub-station at Yaingangpokpi is further connected to recently completed 132 kV Sub-Station at Hundung (2x12.5 MVA). Under NERPSP tranche-I, 2x20 MVA 132/33 kV Sub-Station at Gamphazol along with LILO on Yurembam – Karong 132 kV line has been planned. Further additional 1x20 MVA each is being added to the 132 kV Sub-Stations at Yaingangpokpi and Kongba under State Plan and NERPSP tranche-I respectively. The details of transformation capacity at various 132 kV Sub-stations is given below:

Name of 132 kV S/s	Existing Capacity (MVA)	Anticipated capacity within 1/ 2 year (MVA)	Remarks
Yurembam (Imphal-State)	3x31.5	3x31.5	Commissioning of third transformer is in progress
Karong	2x20	2x20	
Yaingangpokpi	2x20	3x20	
Kongba	2x20	3x20	
Hundung	-	2x12.5	Fully completed
Gamphazol	-	2x20	
Total	214.5	319.5	

15.2 He added that the existing two 132 kV links between Imphal (PG) and Yurembam, one owned by state and other by POWERGRID, would not be sufficient to cater to the anticipated load on Yurembam S/s. In order to strengthen the interconnection between Imphal (PG) and Yurembam, MSPCL has planned to construct Imphal (PG) and Yurembam 132 kV D/C line with high capacity conductor using the RoW of existing Imphal (PG)-Yurembam 132 kV S/C line.

15.3 MD, MSPCL requested POWERGRID to re-conductor their Imphal (PG)-Yurembam 132 kV S/C line with high capacity conductor.

15.4 After further discussion, following was agreed:

- i) Construction of 132 kV Imphal (PG)-Yurembam 132 kV D/C line with high capacity conductor using ROW of existing 132 kV Imphal (PG)-Yurembam

132 kV S/C MSPCL line along with up gradation / modification of bay equipment at both ends. (By MSPCL)

- ii) Re-conductoring of Imphal (PG)-Yurembam 132 kV S/C POWERGRID line with high capacity conductor (by POWERGRID)
- iii) Up gradation / modification of bay equipment at Imphal (PG) by POWERGRID and at Yurembam by MSPCL because of the re-conductoring.

16.0 Additional requirement of OPGW based communication system in intrastate Grid of Manipur

16.1 MD, MSPCL stated that on the request of State Government of Manipur, POWERGRID had prepared a DPR in 2011 for establishment of SLDC system in Manipur covering the existing nine 132 kV Sub-Stations and another two upcoming Sub-Stations at Hundung and Chandel. Scope of work among other includes providing of 11 RTUs and laying of 375 km OPGW based communication system. As follow up of decision of 14th NERPC, POWERGRID has taken up the establishment of SLDC in Manipur with the scope of installation of 11 RTUs on tariff to be recovered as determined by CERC, as a part of the existing Commercial Agreement signed between States and POWERGRID for ULDC system.

16.2 He said that POWERGRID has taken up the work for providing Fibre Optic Communication System in NER under Wide Band Expansion Project covering 149 km for the following links in Manipur.

Imphal(PG)	Yurembam(Imphal-State)	1 Km	
Loktak(NHPC)	Ningthoukhong	10 Km	
Ningthoukhong	Yurembam (Imphal-State)	28 Km	Now, Ningthoukhong line is terminated to Imphal(PG)
Yurembam (Imphal-State)	Karong	60 Km	
Karong	Kohima	50 Km	
	Total	149 km	

16.3 He added that under NERPSIP Tranche-I, 95 km (**42 km in actual**) of OPGW link are covered as given below:

Yaingangpokpi	Yurembam(Imphal-State)	90 km	42 km in actual
Yurembam(Imphal-State)	Imphal(PG)	5 km	Already included in NER wide Band Expansion
		95 km	

16.4 He stated that the following RTU links shall be left without any OPGW connectivity for integration of the Sub-Stations in SLDC, Manipur and shall definitely affect the intrastate grid management with possible cascading effect on the NER Grid. Government of Manipur is in no position to take up the balance work due to poor financial health of the State.

Yaingangpokpi	Kongba	32 Km
Kongba	Kakching	45 Km
Kakching	Churachandpur	38 Km
Yaingangpokpi	Hundung	32 Km

Kakching	Chandel	25 Km
Loktak(NHPC)	Rengpang	47 Km
Jiribam	Jiribam(PG)	1 Km
		220 Km

16.5 He added that in the interest of Grid Security and proper management of power supply system in Manipur, PGCIL may take up the OPGW connectivity of additional 220 km on tariff to be recovered as determined by CERC and the scope may be incorporated in the existing Commercial Agreement signed between States & PGCIL for ULDC system. He informed that OPGW connectivity requirement at 33 kV level has been taken up by MSPCL separately under state plan.

16.6 POWERGRID agreed to take up the additional OPGW connectivity on the basis of tariff as determined by CERC to be recovered from MSPCL.

17.0 Installation of Bus Reactor at Ranganadi – Agenda by NERPC

17.1 SE, NERPC stated that there is a requirement of Bus Reactor at Ranganadi HEP to contain overvoltage problem at Ranganadi. This issue has discussed in various meetings of NER.

17.2 Director, CEA enquired about the voltage profile at Ranganadi, rating of the reactor required and availability of space at Ranganadi.

17.3 SE, NERPC stated that maximum voltage 440 kV has been experienced at Ranganadi and 80 MVar bus reactor would be required to contain the overvoltage.

17.4 Manager, NEEPCO stated that hill cutting would be required to create space for installation of the bus reactor.

17.5 After discussion installation of 80 MVar bus reactor at Ranganadi by NEEPCO was agreed.

18.0 Installation of 3rd Transformer at 400/132/33kV at Silchar Sub Station – Agenda by NERPC

18.1 SE, NERPC stated that at present 2X200 MVA 400/132/33kV transformation capacity is existing at Silchar Sub Station. Present loading at Silchar 400/132 kV transformer is about 300 MW. The transformation capacity at Silchar would not be sufficient to meet the outage of one transformer. Accordingly, it is proposed to install one more transformer at Silchar Sub Station. This issue has been discussed in various NER meetings.

18.2 Director, CEA stated that 400 kV operation of Silchar-Imphal 400 kV D/C line would reduce the loading on Silchar transformer. He also enquired about the availability of space at Silchar for the 3rd transformer.

18.3 GM, POWERGRID stated that even after 400 kV operation of Silchar-Imphal 400 kV D/Cline, the n-1 contingency criterion at Silchar would not be satisfied. He confirmed about the availability of space for the 3rd transformer. Keeping long term load growth in view, he suggested installation of 315 MVA 400/132 kV transformer.

18.4 After further discussions, Members agreed to the installation of 3rd 315 MVA 400/132 kV transformer at Silchar along with associated bays in GIS by POWERGRID keeping in view n-1 contingency and long term load growth.

19.0 Requirement of additional regional spare transformers & Reactors – Agenda by NERPC

19.1 SE, NERPC stated that there is a requirement of additional spare Transformers and Reactors in NER to meet critical breakdown. The spares requirement has been discussed in various meetings of NER. The constituents of NER has consented for procurement of following spare quantity of Transformers and Reactors.

S. No.	Equipment			Remarks
	Rating	In Service	Proposed Spare	
1.	220/132 kV, 160 MVA Transformer	1 no in Service and 3 nos. to be installed	1	2 units each at Balipara and Kopili. Spare shall be positioned at Kopili SS.
2.	132/33 kV, 50 MVA, Transformer	2 nos. to be installed	1	2 units at Nirjuli S/s. Spare shall be positioned at Nirjuli S/s.
3.	400/132/33 kV, 200 MVA, Transformer	2	1	2 units at Silchar S/s. Spare shall be positioned at Silchar SS.
4.	400/220/33 kV, 315 MVA, Transformer	1 no in Service and 2 nos. to be installed	1	1 no. in service at Misa. 1 no each will be installed at Balipara and Bongaigaon
5.	400 kV 80 MVAR Reactor	3	1	2 units at Bongaigaon and 1 unit at Balipara S/s. Spare shall be positioned at Bongaigaon SS.
6.	400 kV 63 MVAR Reactor	18	1	1 no. Spare already available

19.2 AGM, POWERGRID informed that a no. of 400/220 kV 315 MVA transformers and 63 MVAR reactors taken out of service are available in other region as spare. These transformers and reactors can be brought to NER from other region.

19.3 After further discussions, Members agreed to the procurement of regional spares as indicated above. However, the availability of these spares in other regions and whether their transportation would be economical may be explored before procurement.

20.0 Formation of Second node in NER-ER Corridor – agenda by NERPC

- 20.1 SE, NERPC stated that at present, the ER-NER corridor is connected mainly through 400/220kV Bongaigaon S/s. In case of any eventuality at Bongaigaon S/s, there is no second in feed to NER from national grid. He suggested 400 kV Bongaigaon TPP of NTPC or 400 kV Rangia / Rowta S/s as second node along with reconfiguration of 400 kV links to ER.
- 20.2 AGM, POWERGRID informed that one pole of ± 800 kV HVDC Biswanath Chariali-Agra line is expected to be commissioned shortly. This HVDC has the provision of operation in reverse mode also. In the event of outage of Bongaigaon S/s, the power to the NER can be supplied through reverse mode operation of this HVDC.
- 20.3 AGM, NLDC stated that once NER gets disconnected on AC system, the frequency would vary and the effectiveness of HVDC frequency controllers is yet to be tested. He emphasised the need of 2nd AC node in NER for interconnection with NER grid and suggested to explore the possibility of LILO of one of the circuits from Binaguri (subsequently Alipurduar) to Bongaigaon at Azara so that NER would have another infeed point from outside the region, apart from infeed at Bongaigaon.
- 20.4 AGM, POWERGRID informed that Alipurduar 400 kV S/s is planned as a part of evacuation system from upcoming hydro projects in Bhutan and both quad circuits of Bongaigaon-Silliguri 400 kV D/c line are planned to be LILO at Alipurduar. In order to have Balipara 400 kV S/s as second AC node, bypassing of Balipara-Bongaigaon 400 kV D/C quad line with series compensation at Bongaigaon can be studied after the commissioning of Alipurduar S/s.
- 20.5 After further discussions, it was agreed that there is a need for 2nd 400 kV AC node for interconnection with national grid and detailed studies are required to be carried out to identify the second node and its inter-connection with the national grid.
- 21.0 Construction of 132kV D/C line from Rupai in Assam to Namsai in Arunachal Pradesh as Inter-State Transmission Line by POWERGRID – agenda by NERPC**
- 21.1 SE, NERPC stated that several districts like Lower Dibang Valley, Lohit, Anjaw and Namsai are solely dependent on 33 kV transmission system for drawing its share of Central Sector Power. Department of Power, Arunachal Pradesh has proposed construction of 132 kV D/C line from Rupai (AEGCL) to Namsai by POWERGRID in order to remove transmission bottleneck and low voltage problems.
- 21.2 SE, DoP Arunachal Pradesh, requested for construction of this link by POWERGRID to improve the power supply position in the above districts.
- 21.3 Director, CEA stated that the comprehensive scheme for strengthening of transmission and distribution system in Arunachal Pradesh covers implementation of 132 kV corridor from Western part of Arunachal Pradesh to Eastern part and then to South of Arunachal Pradesh. With the development of the 132 kV system in Arunachal Pradesh under comprehensive scheme, the low voltage and transmission bottleneck faced by Arunachal Pradesh in

Lower Dibang Valley, Lohit, Anjaw and Namsai districts would be removed. The comprehensive scheme would be implemented within 48 months from the date of release of first instalment and is expected by 2018-19.

- 21.4 AGM, AEGCL informed that there is a space constraint at Rupai.
- 21.5 GM, POWERGRID informed that the DoP, Arunachal Pradesh is yet to complete the Along-Passighat 132 kV line. Completion of this line would also help in improving voltage profile in Eastern districts of Arunachal Pradesh.
- 21.6 After further discussions, Members requested DoP, Arunachal Pradesh to expedite the Along-Passighat 132 kV line. The requirement of the proposed link can be studied after the completion of 132 kV corridor envisaged in the comprehensive scheme.

22.0 Ownership of Intra-State Transmission System – agenda by NERPC

- 22.1 SE, NERPC has stated that Arunachal Pradesh (A.P) has a small Grid System consisting of only 19 c kms of 220 kV and 169 ckm of 132 kV transmission Lines. The Grid System is owned, controlled, operated and maintained by several agencies, which may pose serious threat to system efficiency, integrity and security. Therefore, it is proposed for transferring and handing over all such Transmission element, intra-State in nature, which are starting and terminating within the territorial Jurisdiction of the State to State Transmission Utilities by any other transmission utilities and agencies to be owned, operated and maintained by the STU. Similarly, the state transmission utility and other transmission agencies shall transfer and handover all such transmission elements, inter-state in nature, which are starting in the State or vice versa to the POWERGRID to be owned, operated and maintained by them.
- 22.2 Director, CEA stated that transferring of transmission assets from one agency to other involve lot of commercial and other issues. He requested that DoP, Arunachal Pradesh to take the help of Government of Arunachal Pradesh in this regard.
- 22.3 DoP, Arunachal Pradesh informed that they do not have the expertise for maintenance of 132 kV system.
- 22.4 After further discussions, members did not agreed to the proposal. Members advised Arunachal to develop their expertise as they have to handle a no. of 132 kV S/s being implemented under the comprehensive scheme in near future.

23.0 Additional Transmission line to evacuate enhanced generation of RC Nagar – agenda by NERPC

- 23.1 SE, NERPC has stated that in the previous Standing Committee meeting, it was decided to re-conductor Agartala GBPP – Agartala S/s (State) 132 kV D/c line – 8 km with high capacity HTLS conductor by POWERGRID in order to evacuate additional generation of 2x25.5 MW at AGTPP. System studies carried out by NERLDC indicate requirement of new line for safe evacuation of power from 4x21+2x25.5 MW AGTPP. From the studies, it is seen that in the event of outage of Agartala GBPP – Agartala line, critical lines of

- POWERGRID and TSECL will become highly loaded. To overcome this problem, NERLDC has suggested an additional 132 kV D/C line from AGTPP.
- 23.2 Director, CEA stated that in the previous meeting re-conductoring of Agartala GBPP - Agartala (State) 132kV D/c line with high capacity conductor was agreed to evacuate enhance generation of R C Nagar as most of power from Agartala GBPP was flowing towards Agartala.
- 23.3 DGM, POSOCO informed that system studies corresponding to minimum load condition with present network in Tripura indicate overloading on Agartala-Kumarghat132 kV line and other critical lines of Tripura under N-1 condition. Various n-1 contingency conditions has been studied, which indicate the requirement of Agartala-P. K. Bari 132 kV D/C line. Further, the system studies carried out with 100 MW export to Bangladesh also indicate the requirement Agartala to P. K. Bari 132 kV D/C line.
- 23.4 Director, CEA stated that additional 132 kV line from Agartala GBPP would require 2 no. 132 kV line bays at Agartala GBPP and P. K. Bari. NEEPCO and TSECL confirmed the availability of space for 2 no. 132 kV bays at Agartala GBPP generation switchyard and P. K. Bari S/s.
- 23.5 After detailed deliberation, members agreed for construction of 132 kV D/C line with high capacity HTLS conductor (equivalent to single moose) from AGTPP to P. K. Bari (under TBCB) in addition to re-conductoring of Agartala-Agartala 132 kV D/C line (By POWERGRID) as agreed in the previous meeting. The AGTPP – P. K. Bari 132kV D/c line with high capacity HTLS conductor (equivalent to single moose) may be included as a part of NERSS-V scheme.
- 24.0 Installation of 2nd 400/132kV Transformer at Palatana to meet N-1 Criterion –agenda by NERP**
- 24.1 SE, NERLDC stated that at present there is only one no. of 125 MVA, 400/132kV ICT at Palatana. Tripura System is connected to Palatana at 132 kV. Outage of this transformer leads to reduction in reliability in power evacuation from Palatana and lose of connectivity with Tripura. Further, Palatana also draws a part of its auxiliary power requirement from 132 kV Grid of Tripura. The tripping of this ICT at Palatana may lead to tripping of Palatana units due to failure of auxiliary power supply. Further, about 100MW power is planned to be exported to Bangladesh from Tripura by December, 2015.The issue of installation of 2nd transformer was deliberated in 111thOCC meeting and the sub-committee requested OTPC to install one more ICT for redundancy.
- 24.2 Representative from OTPC informed that procurement of 2nd ICT at Palatana is under progress.
- 24.3 Members noted the same and advised OTPC to expedite its implementation.
- 25.0 Standardisation of OPGW in lieu of One Earth wire in all Transmission lines – agenda by POWERGRID**
- 25.1 AGM, POWERGRID stated that the Power System requirement for Communication is increasing multi fold due to

- (a) Special Protection Scheme
 - (b) Ever increasing data reporting to Load Dispatch Centre
 - (c) Phasor measurements based data collection and reporting
 - (d) Remote monitoring/operation of sub-station/elements
 - (e) Differential protection on Lines
- 25.2 He said that the practice of putting fibre in select lines lead to situation where station connectivity is held up due to either delay in construction of identified line, LILO of under construction line etc. Further, the OPGW installation on existing lines is taking long time / delayed due to shut down, ROW issues as well as capacity constraints of executing agencies.
- 25.3 He added that it is proposed to include one Ground Wire as OPGW (24 Fibres) in all transmission lines to be taken for implementation. This will ensure availability of wideband Communication from all substations to cater bandwidth for various power system application for which communication equipment (SDH– STM-16) need be provided at all upcoming substations.
- 25.4 Members agreed for the same.
- 26.0 Necessary upgradation / modification in bay equipment at both ends for Reconductoring of Agartala GBPP - Agartala (State) 132kV D/c line-agenda by POWERGRID**
- 26.1 AGM, POWERGRID stated that reconductoring of Agartala GBPP - Agartala (State) 132kV D/c line with high capacity conductor was agreed in the previous SCM. Subsequently, it was observed that ratings of bay equipment at Agartala 132 kV sub-station of TSECL and 132 kV switchyard of Agartala GBPP are not commensurate with rating of the new high capacity conductor. Accordingly, necessary up-gradation / modification in bay equipment at both ends viz. Agartala (TSECL) and Agartala GBPP shall be required.
- 26.2 Members agreed for up-gradation / modifications in bay equipments at both ends by POWERGRID.
- 27.0 Installation of 31.5 MVAR, 220 kV bus reactor at Mokokchung sub-station of POWERGRID**
- 27.1 GM, POWERGRID informed that there is persistent overvoltage problem at 220/132 kV Mokokchung sub-station of POWERGRID as the power flow on Mariani-Mokokchung 220 kV D/C line is very low. In order to contain over voltage problem at Mokokchung, a bus reactor is required.
- 27.2 Members agreed to install 31.5 MVAR 220kV bus reactor at 220/132kV Mokokchung Sub-station of POWERGRID.

The meeting ended with the thanks to Chair.

**List of participants of 5th Standing Committee Meeting on Power System Planning in
North Eastern Region held at Imphal on 08.08.2015**

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